

Semester 5

MSC-5

Topic: - Gene Mutation:

A gene mutation is a permanent change in the DNA sequence of a gene, which alters the genetic information and may change the structure or function of a protein.

DNA contains genetic instructions, and when its sequence changes, it can affect how the gene works.

Cause of Gene Mutation -

Gene mutations can occur due to

A. Spontaneous Mutations -

Occurs naturally during DNA replication due to errors.

B. Induced mutations - (Mutagens)

Mutagen are agents that cause mutation.

eg: DNA Sequence

Normal DNA

ATG GAA TTC CGA

Mutated DNA

ATG GTA TTC CGA

Here GAA changes to GTA → this is mutation

Teacher's Signature: _____

Types of Gene mutation

1. point mutations-

A mutation where only one nucleotide is changed

ATG CCG GCA $\rightarrow$ ATG CGG GCA

Type of point mutation

a. Silent mutation

$\rightarrow$ Nucleotide changes, but protein remains the same.

$\rightarrow$ No effect on organism

eg $\rightarrow$ AAA $\rightarrow$ AAG both code for same amino acid (lysine)

b. Missense mutation

$\rightarrow$ One nucleotide change

$\rightarrow$ Different amino acid is produced

eg $\rightarrow$ GAA (Glutamic acid) $\rightarrow$ GUA Valine

protein structure change

eg - sickle cell anemia